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November 5, 2002

Commissioner Robert Pernell
Commissioner Arthur H. Rosenfeld
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Residential Glazing Percentage in the *2005 Standards Draft #1*

Dear Commissioners Pernell & Rosenfeld,

The first draft of the 2005 Standards increases the fenestration (glazing) percentage in prescriptive Package D in 9 climate zones from 16% to 20%, and increases duct insulation in 13 climate zones from R-4.2 to R-8. These are the only substantive changes to Package D which sets the energy budget for the performance method now used in the vast majority of residential Title 24 permit submittals. **With the proposed increase in prescriptive glazing percentage, the Commission is increasing the energy budget, total energy use and peak electricity use for most homes built in the cooling climates.** For this relatively large class of residential construction, the proposed change is moving backwards from the current 2001 Standards; and is contrary to the goals of AB970.

How much total energy cost and peak electric capacity is at stake? Here is a simple calculation to illustrate the point.

Take a typical 2,500 sf two-story house in Climate Zone 12 designed with 19% total fenestration (with typical glazing distribution). Using certified compliance software, one can just meet the 2001 Standards in all four orientations assuming a cost-effective combination of energy measures. The average peak cooling load for this house design is 3.41 nominal tons equivalent to 4.10 KW. The 30-year DOE-recommended Present Worth of site energy for this house is $11,822 assuming $0.14/KWh and $0.65/Therm.

Under the 2005 Standards -- including the effect of R-8 duct insulation in the Standard Design and assuming more TDV energy for cooling than in the current performance calculation – *the same house with the same physical measures that just meet the 2001 Standards will then be allowed 1.2% more glazing.* That house will have an average peak cooling load of 3.54 nominal tons equivalent to 4.25 KW; and the 30-year Present Worth of energy for that house design will be $12,102.

Assuming that there are 100,000 of homes like this built annually in the affected climate zones, it will result in an increased peak electric load of 15 megawatts. The increase in 30-year Present Worth of energy for these homes will be $28,000,000. *In a 25 year period, this adds up to a total increase of 375 megawatts of peak electricity demand and a total of $700 million dollars in additional homeowner energy costs as compared with the same homes that just meet the 2001 Standards.*

The draft 2005 *Residential ACM Manual* states that when the Proposed Design has less fenestration area than Package D allows, the Standard Design will "track" the same total glazing percentage. Commission Staff and consultants insist that because of this provision, there will be an overall (weighted average) energy saving and peak electricity saving when adding the effects of all residential construction under the new Standards. That characterization is a false portrayal of the proposed Standards. The savings associated with standards that track the glazing percentage of the Proposed Design downwards in the performance approach *has no inherent or rational connection to the issue of increasing the prescriptive fenestration allowance in 9 climates zones for houses that are now allowed only 16% glazing.* It is time that the Commissioners, Staff and consultants consider separately these two important changes to the Standards; and that Staff and consultants be directed to evaluate separately and quantify the impacts of each.

The main arguments against the fenestration increase in the low-rise residential Package D measures contained in the *2005 Standards Draft #1* are:

- The state is giving away significant energy savings that are currently being realized successfully under the 2001 Standards;

- This give-away contradicts the mandate of the AB970 legislation;

- The change runs counter to the whole notion of instituting TDV source energy into the performance standards (which give proportionately larger credits and penalties associated with peak cooling energy);

- The change undermines the legitimate efforts of the Commission, the Staff and consultants in developing other genuinely worthwhile improvements in energy efficiency within the 2005 Standards;

- The change sends the wrong message to building designers, homeowners and the building industry that there is no real relevance or value to regional architecture which traditionally controls the glazing area in homes in especially hot climates in order to mitigate indoor temperatures and reduce energy use;

- The change increases the energy use and peak energy of custom single family homes on the backs of multi-family, low-income and affordable housing – when the latter category of dwellings is already using far less energy per residential unit than the former; and,

- The change sets a bad precedent in moving away from energy efficiency for a rather large class of new construction -- something that, to my personal knowledge, has never occurred before with this potential impact in the 25 years that the Building Energy Efficiency Standards have been in effect.

I strongly urge the Standards Committee to re-evaluate this aspect of the draft 2005 Standards. A preferable approach for correcting this problem is to **retain the prescriptive fenestration percentages as they are in the 2001 Standards. Allow the Standard Design to track the Proposed Design down to, but not below, 14% in the mild climates** (i.e., the zones which currently are allowed 20% glazing) **and 12% in the cooling climates** (i.e., the zones which currently are allowed 16% glazing).

The advantages of the approach outlined here are:

1. The Commission does not give away the energy savings and peak electricity reductions already being achieved under the current Standards;

2. The Commission accrues new savings and reductions, as Staff has already summarized, in virtually all single family homes with fenestration percentages below the Package D limits; and,

3. The Commission provides a small measure of relief to multi-family, low-income and affordable housing which are built at the very low end of the glazing area continuum.

If you have any further interest in the comments expressed, I am available to discuss them in a future meeting.

[Although I serve as a CABEC co-representative on nonresidential standards issues, I would like to state that these comments – although close to the CABEC position in several important respects – represent my own individual analysis and point-of-view.]

Sincerely,

Michael D. Gabel

Michael Gabel

Cc: Bill Pennington, CEC
Charles Eley, Eley Associates
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Bill Mattinson, Sol*Data
Gary Farber, Farber Energy Design
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